BOX PATENT APPLICATION
ASSISTANT COMMISSIONER FOR PATENTS
Washington, D.C. 20231

Sir:

Transmitted herewith for filing is the patent application of
Applicant(s):   Richard D. Cappels, Sr.
Title: System and Method for Generating High-Luminance Windows on a Computer Display Device

Enclosed are:
[x]   27 pages of specification, claims and abstract.
[x]   8 sheets of [x] informal [ ] formal drawing(s).
[x]   A declaration and power of attorney.
[x]   An assignment transmittal.
[x]   An assignment of the invention to: **Apple Computer, Inc.**
        Please record the assignment and return to the undersigned.
[ ]   A certified copy of a _____ application.
[ ]   An associate power of attorney.
[ ]   A verified statement to establish small entity status under 37 CFR §§ 1.9 and 1.27.
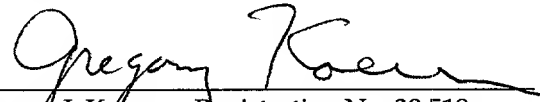[ ]   PTO Form-1449 and copies of cited art.

The filing fee has been calculated as shown below:

For	(Col. 1) No. Filed	(Col. 2) No. Extra	Small Entity		or	Other Than a Small Entity	
			Rate	Fee		Rate	Fee
Basic Fee				$375.00			$770.00
Total Claims	20- 20	0	x $11 =	$		x $22 =	$0.00
Indep. Claims	4- 3	1	x $40 =	$	or	x $80 =	$80.00
Multiple Dependent Claims Present [ ]			+ $130 =	$		+ $260 =	$
*If the difference in column 1 is less than zero, enter 0 in column 2			Total	$	or	Total	$850.00

[ ]   Please charge my Deposit Account No. 06-0600 the amount of $_____. **A duplicate copy of this sheet is enclosed.**

[x]   A check in the amount of $890.00 to cover the filing fee [x] and recording of assignment is enclosed.

[x]   The Commissioner is hereby authorized to charge payment of the following fees during the pendency of this application or credit any overpayment to Deposit Account No. 06-0600. **A duplicate copy of this sheet is enclosed.**
        [x]   Any additional filing fees required under 37 CFR § 1.16.
        [x]   Any patent application processing fees under 37 CFR § 1.17.
        [ ]   The issue fee set in 37 CFR § 1.18 at or before mailing of the Notice of Allowance, pursuant to 37 CFR § 1.311(b).

Respectfully submitted,

Dated: 7- 25- 97

Gregory J. Koerner, Registration No. 38,519
Carr, DeFilippo & Ferrell *LLP*
2225 East Bayshore Road, 94303
(415) 812-3439

1   **SYSTEM AND METHOD FOR GENERATING**

2   **HIGH-LUMINANCE WINDOWS ON A COMPUTER DISPLAY DEVICE**

3

4   BACKGROUND OF THE INVENTION

5   1.   Field of the Invention

6   This invention relates generally to computer displays and more

7   particularly to a system and method for generating high-luminance

8   windows on a computer display device.

9

10   2.   Description of the Background Art

11   Optimal and effective presentation of visual information is a

12   significant consideration of manufacturers, designers and users of

13   computer display monitors.   The use of computer displays for conveying

14   various types of visual information is also becoming more important as

15   computer system functionality increases.   For example, a computer

16   application may advantageously insert a separate viewing area or

17   window onto a computer display screen.   The window area may then

18   display selected viewing information that is different from the viewing

19   information presented on the display screen outside the window area.

20   One such implementation displays video information from a video

1   source (such as a video tape recorder) in the window area and

2   simultaneously displays computer generated information (such as text

3   or graphics) on the display screen outside the window area.

4   Referring now to FIG. 1, a diagram of a display 110 is shown. The

5   display 110 includes a screen 112 that displays various types of

6   viewing information to a system user. Display 110 includes a viewing

7   window 114 which may be selectively sized and positioned on screen

8   112. A host computer system (not shown) may then advantageously

9   insert selected video images within the video window 114 for viewing

10 while the neighboring text and/or graphic information is simultaneously

11 displayed on the remaining areas of screen 112.

12   In conventional computer displays that are not specifically

13 designed for displaying video information, luminance levels are

14 typically somewhat lower than the luminance levels used in

15 conventional video displays. These lower luminance levels result in a

16 relatively lower contrast ratio between dark and light areas of

17 displayed information. In practice, window 114 is typically displayed

18 at the same relative luminance levels as much of the surrounding

19 screen 112 on display 110. However, lower luminance levels tend to

20 produce video pictures which appear somewhat drab and washed-out.

1   Conversely, higher luminance levels tend to bring out more detail in the

2   displayed information and thus cause moving video images to appear

3   more vivid and interesting to the viewer.

4   In operation, luminance levels are proportional to the amount of

5   beam current generated in display 110.   Higher luminance levels

6   typically require greater beam current values.   These increased beam

7   currents, however, adversely affect the resolution of displayed

8   information by increasing the spot size of the electron beam as it strikes

9   phosphors lining the inner surface of screen 112.   The increased spot

10   size may result in a blurring of text or graphic information displayed on

11   screen 112.   Increasing beam current also may cause the cathode ray

12   tube (CRT) of display 110 to unacceptably age at a faster degradation

13   rate.   Finally, the production of a higher beam current requires display

14   110 to dissipate a greater amount of power and therefore necessitates a

15   heavier and more costly chassis when manufacturing display 110.

16   The foregoing factors (which are caused by increasing the

17   luminance levels over the entire surface of screen 112) are undesirable

18   in the design and manufacture of computer display monitors.

19   Therefore, an improved system and method for generating high-

1   luminance windows on a computer display device is needed, in

2   accordance with the present invention.

SUMMARY OF THE INVENTION

In accordance with the present invention, a system and method are disclosed for generating high-luminance windows on a computer display device. In the preferred embodiment of the present invention, the computer display includes a video amplifier, a window generator, a high-voltage power supply (HVPS), an automatic beam limiter (ABL) and a cathode-ray tube (CRT). In the preferred embodiment, the video amplifier receives a video signal which includes information for presentation on the computer display. The video amplifier responsively amplifies the received video signal and then applies the amplified video signal to the cathode of the CRT. The HVPS provides a high-voltage signal to the anode of the CRT. The CRT responsively generates an electron beam which strikes phosphors located on the inner surface of the viewing screen of the CRT.

In the preferred embodiment, a processor device typically provides window control signals to the window generator in the computer display in response to a video application program running on a host computer system. The window control signals advantageously gate the generation of high-luminance windows on the computer display, in accordance with the present invention.

5

1 The window generator receives the window control signals and

2 responsively generates and provides a window pulse to the ABL. The

3 generated window pulse provides information about the size and

4 position of the high-luminance windows on the viewing screen of the

5 CRT. The ABL receives the window pulse and responsively generates

6 and provides an analog window signal to the gain control of the video

7 amplifier. The analog window signal thus increases the luminance of

8 the amplified video signal during the period of the high-luminance

9 window by increasing the gain of the video amplifier during the

10 appropriate time period.

11 To prolong the life span of the computer display, the ABL also

12 advantageously limits the average beam current provided to the CRT

13 during the period of high-luminance window. In practice, the ABL

14 samples beam current supplied by the HVPS. If the sampled beam

15 current from the HVPS exceeds a preset threshold value, then the gain

16 of the video amplifier is limited by adjusting the analog window signal.

17 The present invention thus provides a video window with a higher

18 luminance level than the remainder of the information displayed on the

19 screen of the computer display and is therefore able to advantageously

20 generate high-luminance windows on the computer display device.

6

BRIEF DESCRIPTION OF THE DRAWINGS

1

2

3   FIG. 1 is a diagram of a computer display having a window area

4   positioned on the viewing screen of the computer display;

5

6   FIG. 2 is a block diagram of a preferred computer system

7   including a computer display;

8

9   FIG. 3 is a block diagram of the display of FIG. 2, according to the

10   present invention;

11

12   FIG. 4(a) is a drawing of a video waveform illustrating relative

13   video levels including a conventional window area;

14

15   FIG. 4(b) is a drawing of a video waveform illustrating relative

16   video levels including a window area in accordance with the present

17   invention;

18

19   FIG. 5 is a block diagram of the preferred embodiment for the

20   window generator of FIG. 3;

1

2   FIG. 6 is a block diagram showing the communication of control

3   information according to the present invention;

4

5   FIG. 7 is a schematic diagram of the preferred embodiment for the

6   video amplifier and automatic beam limiter of FIG. 3; and

7

8   FIG. 8 is a drawing of a waveform for the analog window signal

9   illustrating the effect of automatic beam limiting.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention relates to an improvement in display devices, including computer displays. The following description is presented to enable one of ordinary skill in the art to make and use the invention and is provided in the context of a patent application and its requirements. Various modifications to the preferred embodiment will be readily apparent to those skilled in the art and the generic principles herein may be applied to other embodiments. Thus, the present invention is not intended to be limited to the embodiment shown but is to be accorded the widest scope consistent with the principles and features described herein.

The present invention comprises a system and method for generating high-luminance windows on a computer display device and includes a video amplifier which provides video signals to a cathode ray tube, a window generator which provides a window signal to the video amplifier to generate the high-luminance window and an automatic beam limiter which controls the beam current provided to the cathode ray tube, in accordance with the present invention.

1 Referring now to FIG. 2, a block diagram of a computer 210 is

2 shown, in accordance with the present invention. Computer 210

3 preferably comprises a central processing unit (CPU) 212, a video

4 display 110, a keyboard 216, an input device 218 and a memory 224.

5 Each element of computer 210 is preferably coupled to a common

6 system bus 226. Memory 224 may alternatively comprise various

7 storage-device configurations, including Random-Access-Memory

8 (RAM), Read-Only-Memory (ROM) and non-volatile storage devices such

9 as floppy disks. In the preferred embodiment, memory 224 includes at

10 least one application 228 and an operating system 230.

11

12 Referring now to FIG. 3, a block diagram of the preferred

13 embodiment for display 110 (FIG. 2) is shown, according to the present

14 invention. Display 110 preferably includes a video amplifier 318, a

15 window generator 326, a high-voltage power supply (HVPS) 320, an

16 automatic beam limiter (ABL) 332 and a cathode-ray tube (CRT) 322.

17 In the preferred embodiment of the present invention, video

18 amplifier 318 receives a video signal via line 310. The video signal

19 includes information for presentation on display 110 and is typically

20 provided by CPU 212 via system bus 226. Video amplifier 318

1   responsively amplifies the received video signal and then applies the

2   amplified video signal to the cathode of CRT 322 via line 319. HVPS

3   320 provides a high-voltage signal to the anode of CRT 322 via line 324.

4   CRT 322 responsively generates and provides an electron beam which

5   strikes phosphors located on the inner surface of the viewing screen in

6   CRT 322. In practice, video amplifier 318 includes three separate color

7   channels (red, blue and green) which generate three separate electron

8   beams in CRT 322, however, for simplicity, the following discussion will

9   reference a single electron beam and corresponding beam current.

10   In the preferred embodiment, CPU 212 also provides a horizontal

11   synchronization (H Sync) signal, a vertical synchronization (V Sync)

12   signal and window control signals to display 110 via system bus 126. H

13   sync is then provided, via line 312, to HVPS 320 and to window

14   generator 326 via line 328. V sync is provided via line 314 to widow

15   generator 326 and the window control signals are also provided, via line

16   316, to window generator 326.

17   The window control signals on line 316 advantageously gate the

18   generation of a high-luminance window on display 110, in accordance

19   with the present invention. In the preferred embodiment, a window

20   request is sent by the host computer operating system 230 or by an

1   application 228 whenever it is desirable to generate a high-luminance

2   window.   In another embodiment, the window request may be relayed

3   through a serial communications channel (such as the Video Electronics

4   Standards Association DDC2AB or the Universal Serial Bus) from a host

5   computer 210 to a separately-enclosed display 110.   The window

6   request causes CPU 212 to provide the window control signals on line

7   316.   The window control signals then enable window generator 326,

8   which, in turn, initiates the process of generating a high-luminance

9   window on display 110.

10   The window generator 326 receives the H sync signal on line 312,

11   the V sync signal on line 314 and the window control signals on line

12   316, and responsively generates and provides a window pulse to ABL

13   332 via line 330.   The generated window pulse provides information

14   about the size and position of window 114 on the viewing screen of CRT

15   322.   Window generator 326 is further discussed below in conjunction

16   with FIG. 5.

17   ABL 332 receives the window pulse on line 330 and responsively

18   generates and provides an analog window signal (on line 336) to the

19   gain control of video amplifier 318.   Analog window signal on line 336

20   thus increases the luminance of the amplified video signal during the

1   period of window 114 by increasing the gain of video amplifier 318

2   during the appropriate time period.   To prolong the life span of display

3   110, ABL 332 also advantageously limits the average beam current

4   provided to CRT 322 during the period of high-luminance window 114.

5   In practice, ABL 332 samples HVPS 320 on line 334 and, if HVPS 320

6   exceeds a preset threshold value, then the gain of video amplifier 318 is

7   limited by adjusting the analog window signal on line 336.   The present

8   invention thus provides a video window with a higher luminance level

9   than the remainder of the information displayed on screen 112 of

10 display 110.

11

12   Referring now to FIG. 4A, a drawing of a video waveform 410

13 including a conventional window area is shown.   Referring also to FIG.

14 4B, a drawing of a video waveform 420 including a high-luminance

15 window area is shown, in accordance with the present invention.   In

16 FIG. 4A, the conventional window area is shown on video waveform 410

17 between times 416 and 418.   Waveform 410 also shows a positive-

18 going black level 412 (which represents minimum luminance) and a

19 negative-going peak white level 414 (which represents maximum

20 luminance).

1   In waveform 420 of FIG. 4B, the high-luminance window area is

2   shown between times 416 and 418. As in FIG. 4A, a positive-going

3   black level 412 and a negative-going peak white level 414 are shown in

4   FIG. 4B. However, in accordance with the present invention, the video

5   waveform 420 also contains video information extending negatively

6   beyond peak white level 414 to reach a super peak white level 422

7   between times 416 and 418 (in the high-luminance window area). The

8   super peak white level 422 thus represents the area of increased

9   luminance provided in the high-luminance window of the present

10   invention.

11

12   Referring now to FIG. 5, a block diagram of the preferred

13   embodiment for window generator 326 (FIG. 3) is shown. Window

14   generator 326 preferably includes a vertical delay or line counter

15   (vertical delay) 516, a horizontal delay 510, a vertical window pulse

16   generator 518, a horizontal window pulse generator 512 and a three-

17   input AND gate 514.

18   In practice, window generator 326 uses vertical delay 516 and

19   vertical window pulse generator 518 to provide the vertical position

20   and vertical size of the window area represented by the window pulse

14

1   on line 330.   Furthermore, window generator 326 uses horizontal delay

2   510 and horizontal window pulse generator 512 to provide the

3   horizontal position and horizontal size of the window area represented

4   by the window pulse on line 330.

5   In one embodiment, vertical delay 516 receives a control signal

6   520 from CPU 212 to indicate the vertical starting location of the

7   window area represented by the window pulse on line 330.   Vertical

8   window pulse generator 518 then receives a control signal 522 from

9   CPU 212 to indicate the vertical ending location of the window area

10   represented by the window pulse on line 330.   Furthermore, horizontal

11   delay 510 receives a control signal 524 from CPU 212 to indicate the

12   horizontal starting location of the window area represented by the

13   window pulse on line 330.   Horizontal window pulse generator 512 then

14   receives a control signal 526 from CPU 212 to indicate the horizontal

15   ending location of the window area represented by the window pulse on

16   line 330.

17   Vertical delay 516 and vertical window pulse generator 518 thus

18   generate a vertical component of the window pulse on line 330 and

19   provide the vertical component to a first input of AND gate 514.

20   Further, horizontal delay 510 and horizontal window pulse generator

15

1   512 generate a horizontal component of the window pulse on line 330

2   and provide the horizontal component to a second input of AND gate

3   514. A third input of AND gate 514 preferably receives a window

4   enable control signal via line 316. When the window enable signal is

5   held to an "active" or "enabled" state, then window generator 326

6   advantageously generates the window pulse on line 330, in accordance

7   with the present invention.

8

9   Referring now to FIG. 6, a block diagram of one embodiment for

10   the communication path of window control information is shown, in

11   accordance with the present invention. The FIG. 6 communication path

12   preferably includes an application program 228, an operating system

13   230, a video generator 610, a data output port 612, a video amp 318

14   and a cathode ray tube (CRT) 322. In this embodiment, the application

15   program 228 is a movie player application which typically sends control

16   signals and video signals to operating system 230. Operating system

17   230 responsively provides the control signals to data output port 612

18   and provides the video signals to video generator 610.

19   Video generator 610 then processes the video signals and

20   provides the processed video signals to video amplifier 318 in display

1   110. Data output port 612 provides the control signals to the beam

2   current control system of the present invention which advantageously

3   controls the gain of video amplifier 318. CRT 322 then receives the

4   amplified video signals from video amplifier 318, including the high-

5   luminance window area provided in accordance with the present

6   invention.

7

8   Referring now to FIG. 7, a schematic diagram of one embodiment

9   for video amplifier 318 and ABL 332 (FIG. 3) is shown. In the FIG. 7

10   embodiment, preamplifier 718 of video amplifier 318 receives a video

11   signal on line 310 and responsively amplifies and passes the video

12   signal through transistor 722 and transistor 728 to generate and

13   provide an amplified video signal to the cathode of CRT 322 via line

14   319.

15   Video amplifier 318 preferably operates in either a normal-gain

16   mode or a high-gain mode. Switching between the normal-gain mode

17   and the high-gain mode is controlled by the state of the analog window

18   signal applied to the gain control of video amplifier 318 via line 336.

19   When the respective bases of transistor 734 and transistor 736 are

20   maintained at the same relative voltage level, then video amplifier 318

1 operates in normal-gain mode, however, when the analog window signal

2 is applied from ABL 332 to the base of transistor 736, then video

3 amplifier 318 operates in high-gain mode.

4 To generate the analog window signal on line 336, ABL 332

5 receives a window pulse on line 330 and responsively passes the

6 window pulse through transistor 776 to line 336. To limit the beam

7 current in CRT 322 during the high-luminance widow, ABL 322 controls

8 the amplitude of the analog window signal on 336. In practice, ABL 332

9 samples the output current of flyback transformer 750 (of HVPS 320)

10 on line 334 and compares the sampled high-voltage output to a preset

11 threshold. If the threshold is exceeded, then transistor 758 adjusts the

12 output of transistor 776 on line 336 (analog widow signal) to effectively

13 limit the beam current in CRT 322.

14

15 Referring now to FIG. 8, a drawing of an analog window signal

16 waveform 810 is shown, in accordance with the present invention.

17 Waveform 810 shows the analog window signal occurring between

18 times 812 and 814. In the FIG. 8 waveform 810, an amplitude 816 is

19 shown for a state in display 110 where ABL 332 is not actively limiting

20 beam current in CRT 322. Additionally, an reduced amplitude 818 is

1   shown for a state in display 110 where ABL 332 is actively limiting

2   beam current in CRT 322.

3   Since the high-luminance window may potentially be large (in

4   some cases nearly as large as the entire screen 112 of CRT 110) it is

5   desirable to automatically limit the average beam current by controlling

6   the video signal gain within the high-luminance window. Although

7   peak luminance in the video window can be 3 to 5 or more times the

8   peak luminance of the rest of the display without increasing the power

9   handling capabilities of the chassis, luminance that exceeds these levels

10   can negatively impact CRT phosphor aging. Using ABL 332 to limit

11   beam current during the window period will prevent these undesirably

12   high levels of luminance. Additionally, since ABL 332 only changes the

13   video signal in the window, the system user will have an improved

14   perception of display 110 performance based on smaller spot size and

15   clarity of text/graphics outside the high-luminance window.

16   The invention has been explained above with reference to a

17   preferred embodiment. Other embodiments will be apparent to those

18   skilled in the art in light of this disclosure. For example, the present

19   invention may readily be implemented using hardware and/or software

20   configurations other than those described in the preferred embodiment

1   above.   Additionally, the present invention may effectively be used in

2   conjunction with systems other than the one described above as the

3   preferred embodiment.   Therefore, these and other variations upon the

4   preferred embodiments are intended to be covered by the present

5   invention, which is limited only by the appended claims.

1   WHAT IS CLAIMED IS:

2

1   1.   A system for generating high-luminance windows on a display

2   device, comprising:

3   a control device coupled to said display device for processing

4   input signals and providing said processed input signals to

5   said display device; and

6   a window generator coupled to said display device for generating

7   widow information and applying said window information to

8   said control device to generate said high-luminance

9   windows.

1   2.   The system of claim 1 further comprising a limiter device coupled

2   to said display device for processing said window information to limit

3   said input signals provided to said display device.

1   3.   The system of claim 2 further comprising a power supply and

2   wherein said limiter device samples said power supply to determine

3   when to limit said input signals.

1 4.   The system of claim 3 further comprising a processor device

2 which provides control signals to said window generator, said control

3 signals including position and size information for said high-luminance

4 windows.

1 5.   The system of claim 4 wherein said display device is a computer

2 monitor including a cathode ray tube which receives said processed

3 input signals.

1 6.   The system of claim 5 wherein said control device is a video

2 amplifier and said input signals are video signals provided by said

3 processor device.

1 7.   The system of claim 6 wherein said limiter device receives and

2 limits said window pulse to generate and provide an analog window

3 signal to said video amplifier.

1 8.   The system of claim 7 wherein said limiter device provides said

2 analog window signal to control a gain control of said video amplifier.

1   9.   The system of claim 8 wherein said limiter device controls a beam

2   current applied to said cathode ray tube in said display device.

1   10.   The system of claim 9 wherein said control signals are generated

2   by an application program for generating high-luminance windows.

1   11.   A method for generating high-luminance windows on a display

2   device, comprising the steps of:

3   processing input signals using a control device coupled to said

4   display device;

5   providing said processed input signals to said display device;

6   generating window information using a window generator coupled

7   to said display device; and

8   applying said window information to said control device to

9   generate said high-luminance windows.

1   12.   The method of claim 11 wherein said window information

2   includes a window pulse, and further comprising the step of processing

3   said window pulse to limit said input signals using a limiter device

4   coupled to said display device.

1 13.   The method of claim 12 further comprising a power supply and

2 wherein said limiter device samples said power supply to determine

3 when to limit said input signals.

1 14.   The method of claim 13 further comprising a processor device

2 which provides control signals to said window generator, said control

3 signals including position and size information for said high-luminance

4 windows.

1 15.   The method of claim 14 wherein said display device is a computer

2 monitor including a cathode ray tube which receives said processed

3 input signals.

1 16.   The method of claim 15 wherein said control device is a video

2 amplifier and said input signals are video signals provided by said

3 processor device.

1   17. The method of claim 16 wherein said limiter device receives and

2   limits said window pulse to generate and provide an analog window

3   signal to said video amplifier.

1   18. The method of claim 17 wherein said limiter device provides said

2   analog window signal to control a gain control of said video amplifier.

1   19. A computer-readable medium containing instructions for

2   generating high-luminance windows on a display device by performing

3   the steps of:

4   processing input signals using a control device coupled to said

5   display device;

6   providing said processed input signals to said display device;

7   generating a window pulse using a window generator coupled to

8   said display device; and

9   applying said window pulse to said control device to generate said

10   high-luminance windows.

1 20. A system for generating high-luminance windows on a display

2 device, comprising:

3   means for processing input signals using a control device coupled

4   to said display device;

5   means for providing said processed input signals to said display

6   device;

7   means for generating a window pulse using a window generator

8   coupled to said display device; and

9   means for applying said window pulse to said control device to

10   generate said high-luminance windows.

SYSTEM AND METHOD FOR GENERATING

HIGH-LUMINANCE WINDOWS ON A COMPUTER DISPLAY DEVICE

ABSTRACT OF THE DISCLOSURE

A system and method for generating high-luminance windows on a computer display device includes a video amplifier which provides video signals to a cathode ray tube, a window generator which provides a window signal to the video amplifier to generate the high-luminance window, and an automatic beam limiter which controls the beam current provided to the cathode ray tube during period of the high-luminance window.

Fig. 2

Fig. 3

412 —⌐Black Level

414 —⌐Peak White Level

416 —⌐   Video
                Window   —⌐ 418

410

Fig. 4A

412 —⌐Black Level

414 —⌐Peak White Level

Super Peak White Level

422

416 —⌐   Video
                Window   —⌐ 418

420

Fig. 4B

Fig. 5

228

Application
Program
(movie Player)

Operating
System

230

610

Video Generator

Data Output Port

612

Cathode
Ray Tube

322

Video Amp

Beam Current Control

318

Fig. 6

Fig. 7

812 ⌇

⌇ 814

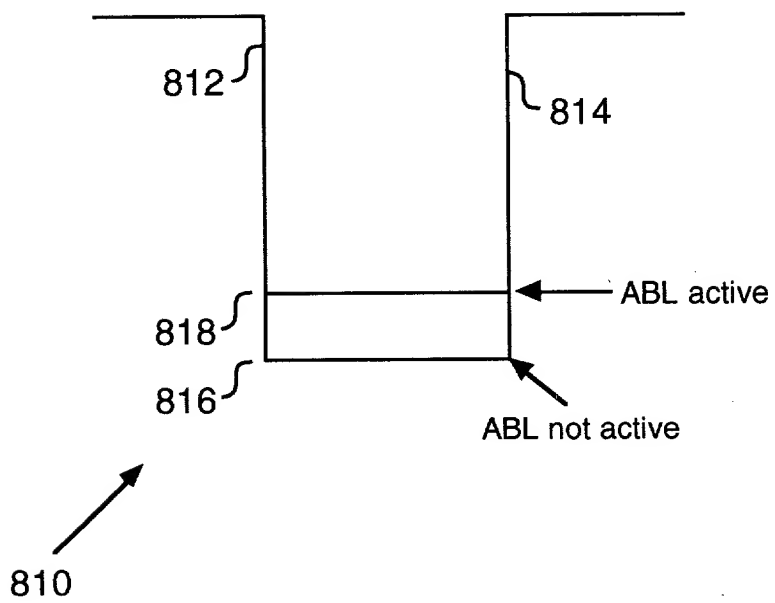818 ⌇   ◄─── ABL active

816 ⌇   ↖ ABL not active

810 ↗
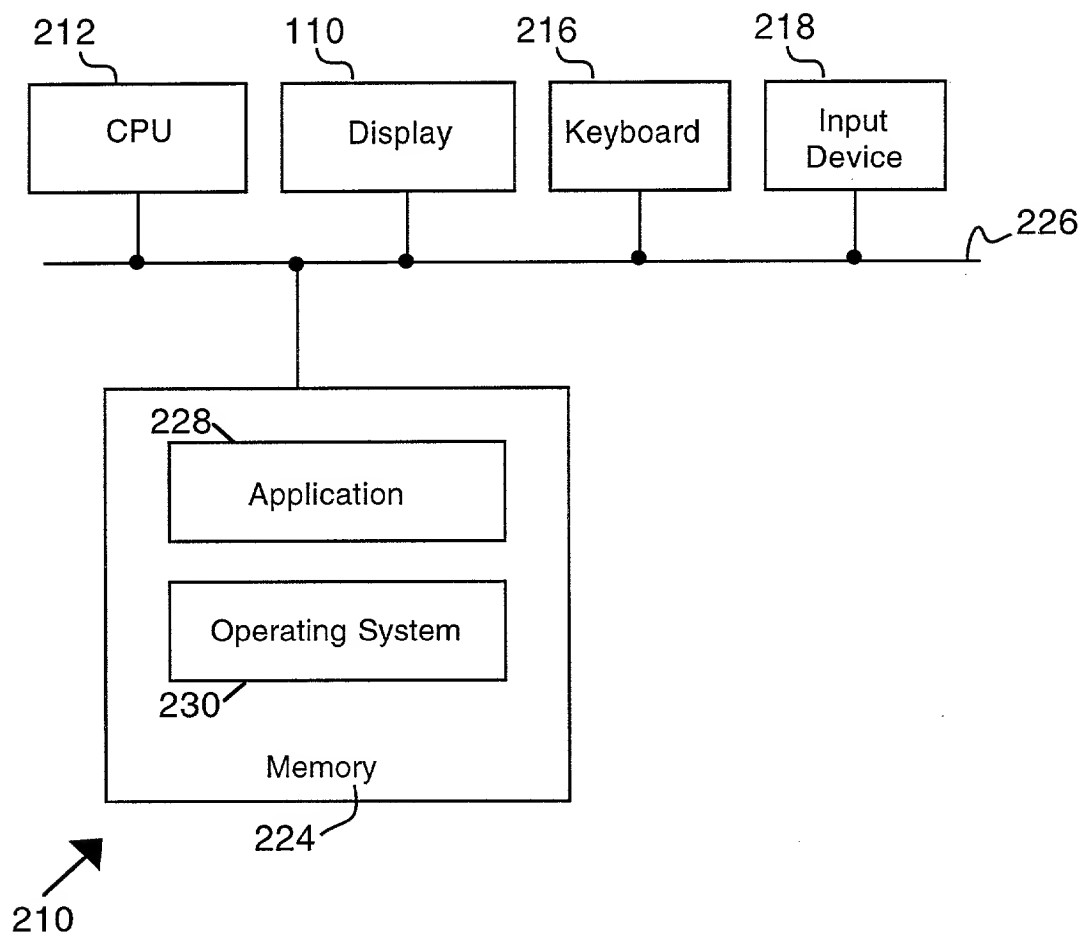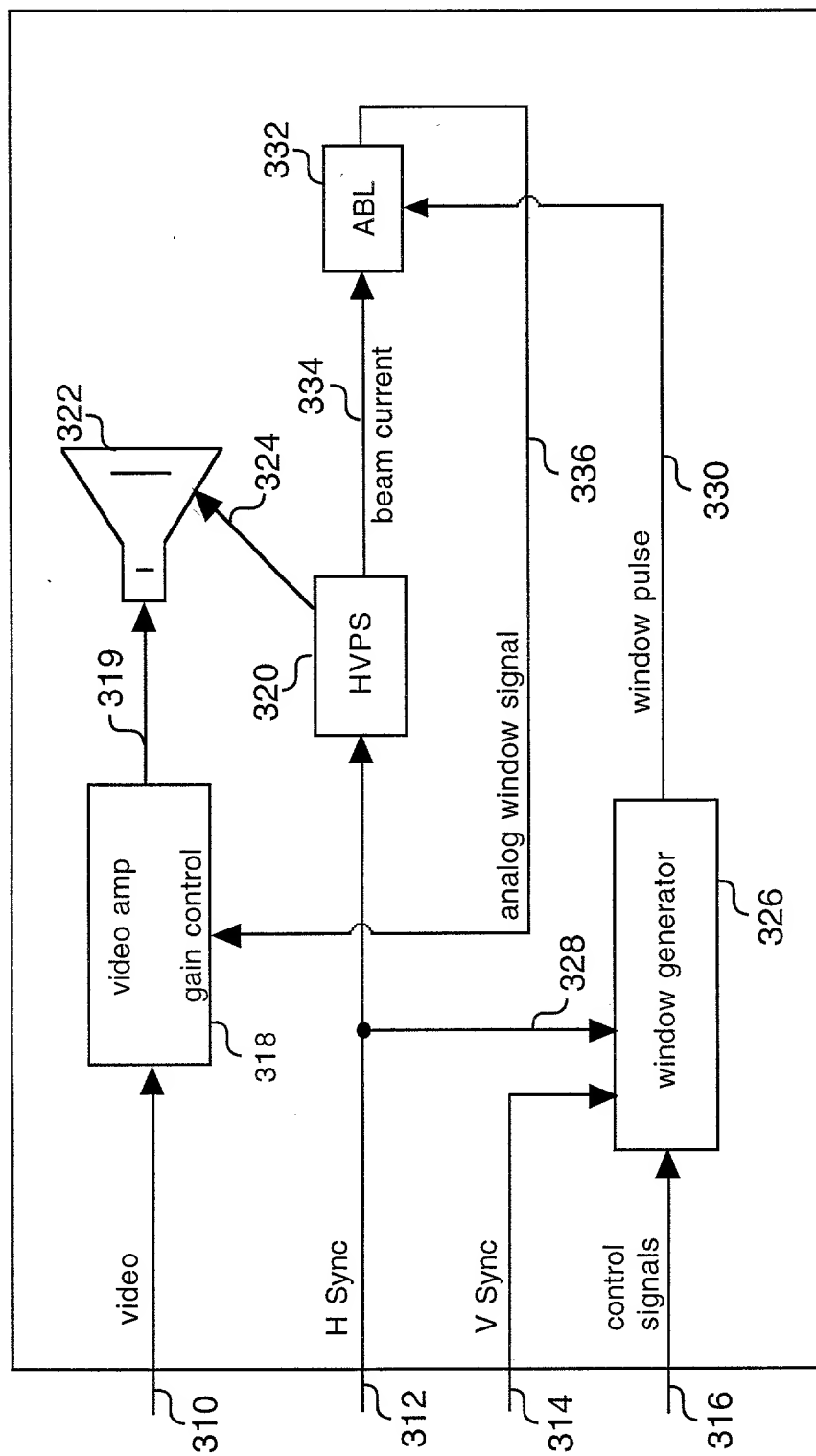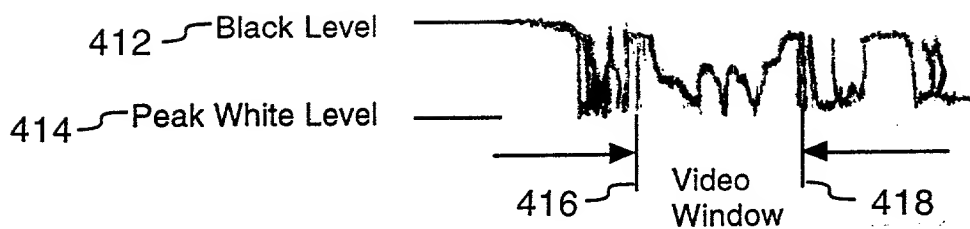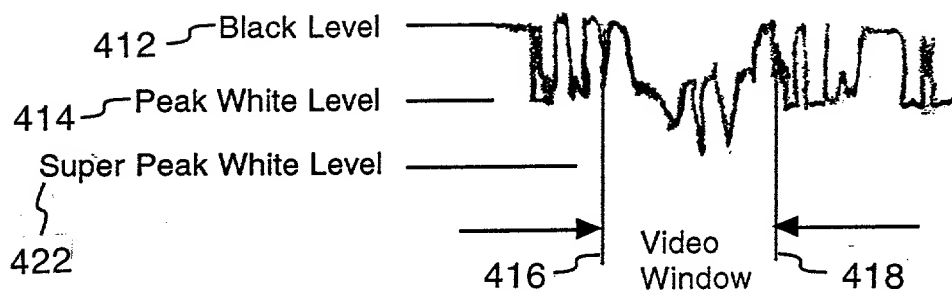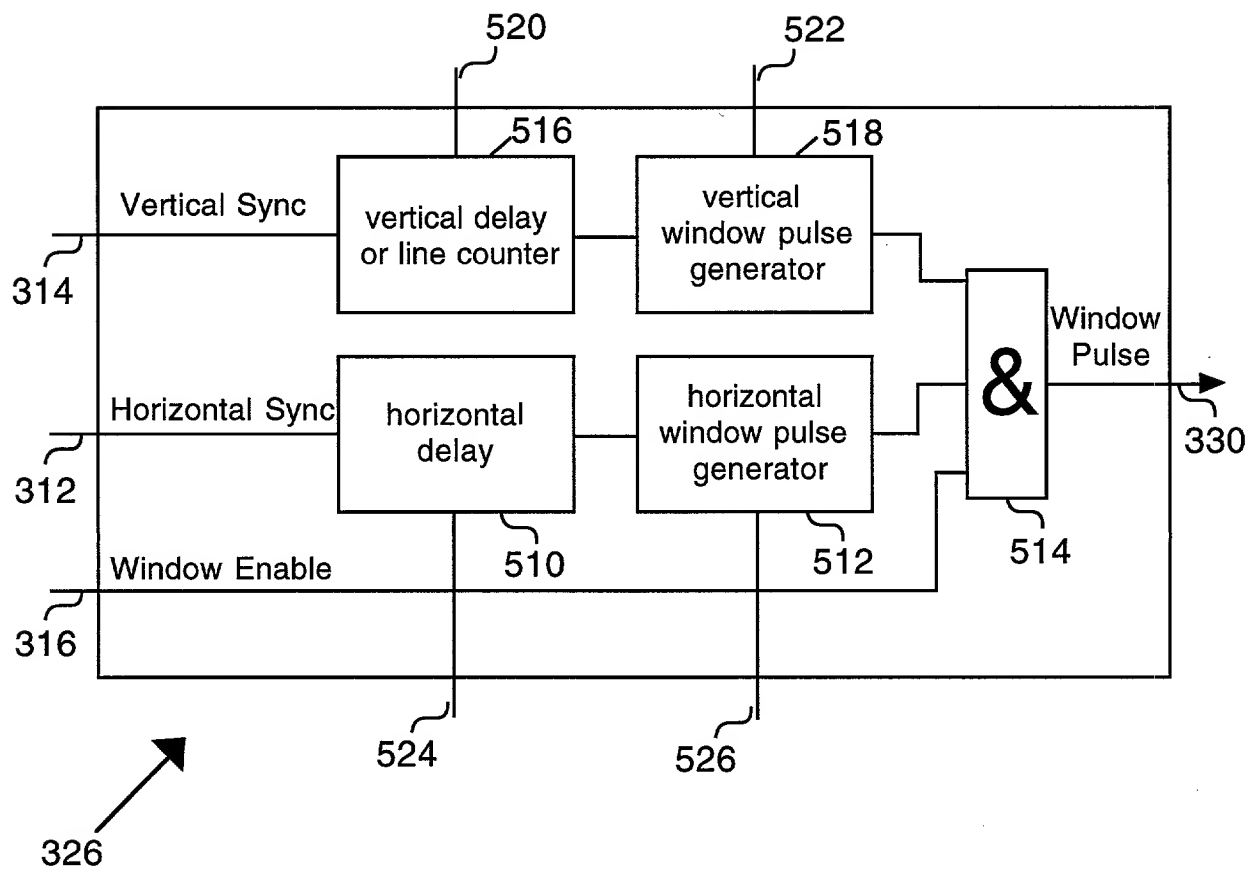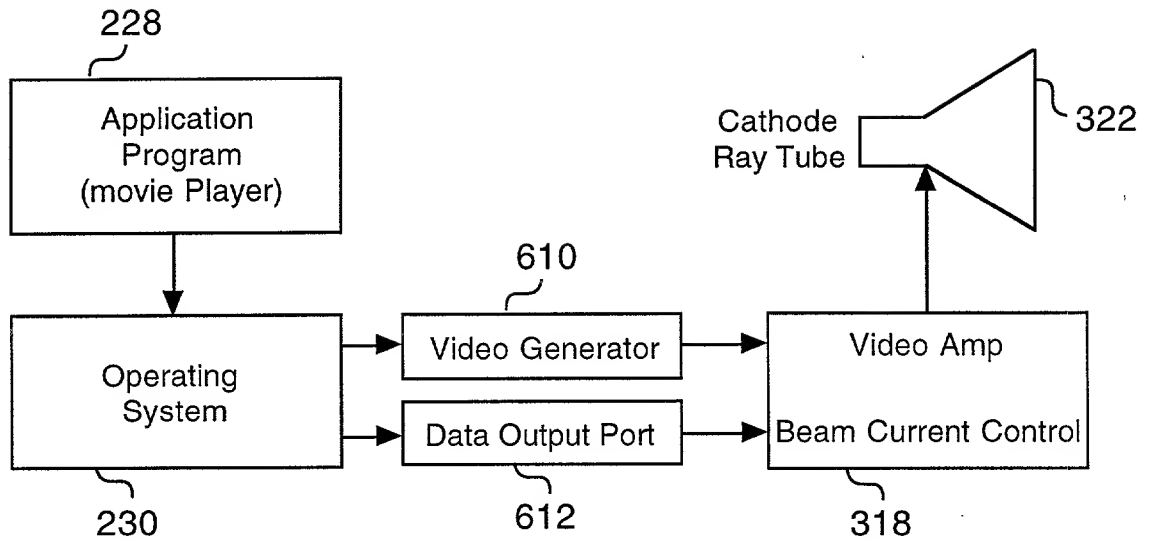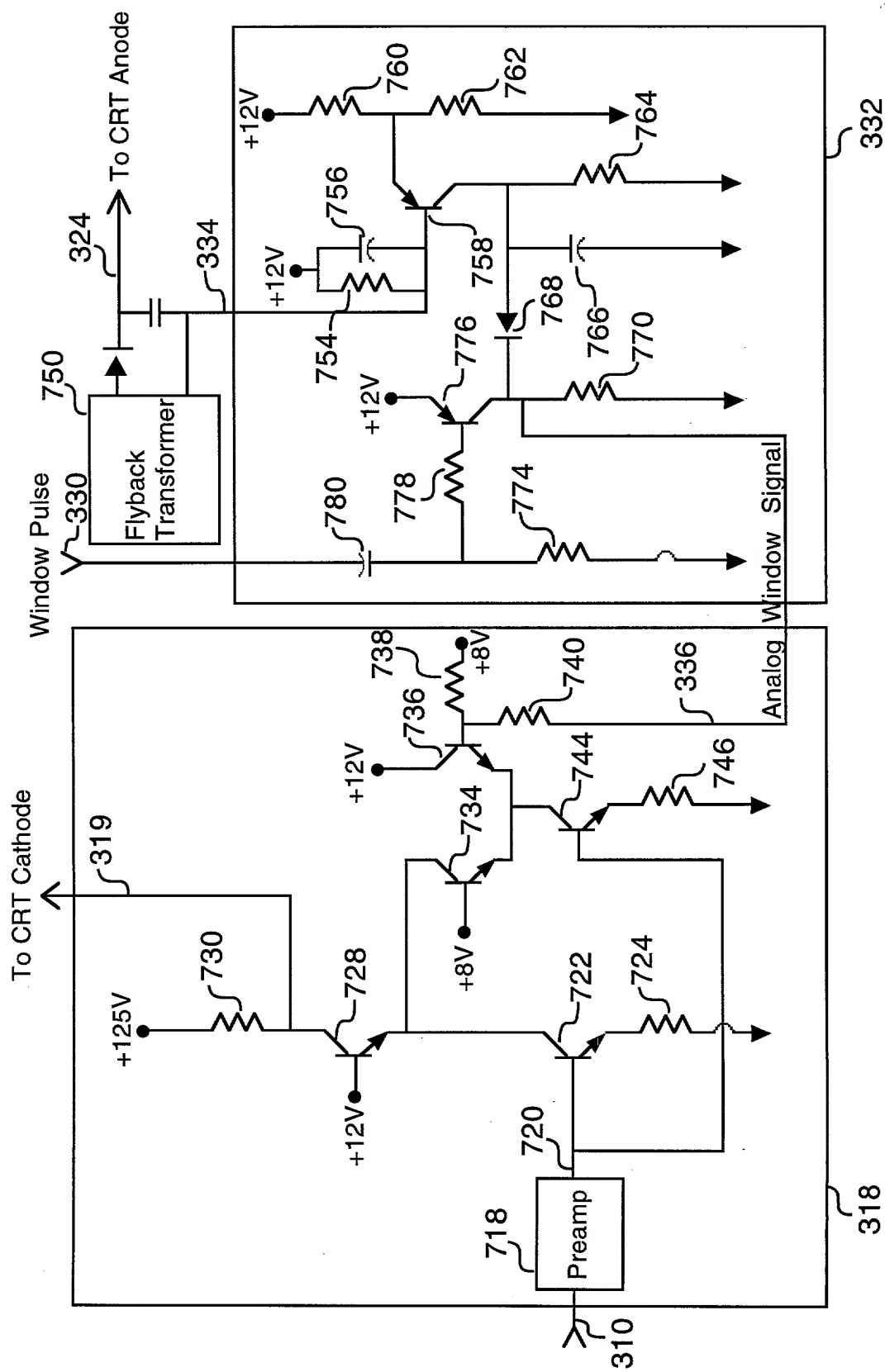
Fig. 8

DECLARATION AND POWER OF ATTORNEY FOR UTILITY PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below, next to my name,

I believe I am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled

"System And Method For Generating High-Luminance Windows On A Computer Display Device"

the specification of which

|X| is attached hereto.
|_| was filed on_____ as _____
     Application Serial No._____
     and was amended on _____
           (if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above. I do not know and do not believe that the same was ever known or used in the United States of America before my invention thereof, or patented or described in any printed publication in any country before my invention thereof or more than one year prior to this application, that the same was not in public use or on sale in the United States of America more than one year prior to this application, and said invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to this application.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119, of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)   Priority Claimed

(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

_____   _____
(Application Serial No.)   (Filing Date)   (Status) (patented, pending, abandoned)

_____   _____
(Application Serial No.)   (Filing Date)   (Status) (patented, pending, abandoned)

I hereby appoint

John S. Ferrell, Reg. No. 34,593; J. Eppa Hite, Reg. No. 30,266
and Gregory J. Koerner, Reg No. 38,519
Carr, DeFilippo & Ferrell
2225 East Bayshore Road, Suite 200
Palo Alto, CA 94303
TEL: (415) 812-3400
FAX: (415) 812-3444

and Mark Aaker, Reg. No. 32,667; Paul D. Carmichael, Reg. No. 18,679; Richard Liu, Reg. No. 34,377; Helene Plotka Workman, Reg. No. 35,981 ; Edward W. Scott, IV, Reg. No. 36,000 and Nancy R. Simon, Reg. No. 36,930 of APPLE COMPUTER, INC., located at 1 Infinite Loop, MS: 38-PAT, Cupertino, California 95014, Telephone (408) 974-9453, my attorneys, with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of Inventor: _____Richard D. Cappels_____

Inventor's Signature_____Dated: 18 July 1997

Residence:_____1187 Olive Branch Lane, San Jose, California 95120_____

Post Office Address:_____Same_____Citizenship:___U.S.A._____

window

114

112

110

Fig. 1